

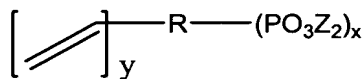
Amendments to the Claims

Please cancel Claims 1-12. Please add new Claims 13-32. The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1-12 (Cancelled)

13. (New) A proton-conducting electrolyte membrane obtained by a method consisting of the steps:
- a) expanding a polymer film with a liquid that contains a vinyl-containing phosphonic acid, and
 - b) polymerizing the vinyl-containing phosphonic acid present in the liquid of step a), characterized in that the intrinsic conductivity of the inventive membrane at temperatures of 160°C is at least 0.001 S/cm.
14. (New) The membrane of Claim 13, characterized in that the film used in step a) has an expansion of at least 3% in the liquid containing vinyl-containing phosphonic acid.
15. (New) The membrane of Claim 13, characterized in that the polymers used in step a) are high-temperature stable polymers which contain at least one nitrogen, oxygen, or sulphur atom in one or more recurring units.
16. (New) The membrane of Claim 13, characterized in that the liquid containing the vinyl-containing phosphonic acid contains compounds of the formula

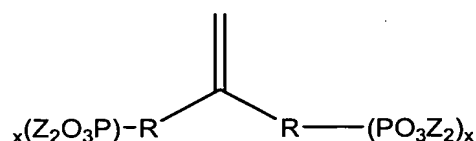


in which

R denotes a bond, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂

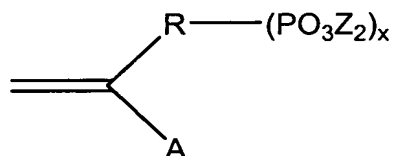
- Z independently of each other denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂ and
- x denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10
- y denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10

or the formula



in which

- R denotes a bond, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂,
- Z independently of each other denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂, and
- x denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10,
- or the formula



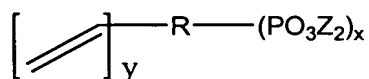
in which

- A represents a group of formula COOR², CN, CONR², OR², or R², in which R² denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, or C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂,

- R denotes a bond, a bivalent C1-C15 alkylene group, bivalent C1-C15 alkyleneoxy group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂,
- Z independently of each other denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, or C5-C20-aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂, and
- x denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10.

17. (New) The membrane of Claim 13, characterized in that the liquid containing the vinyl-containing phosphonic acid contains monomers that are capable of cross-linking.
18. (New) The membrane of Claim 13, characterized in that the liquid containing the vinyl-containing phosphonic acid contains at least one substance that is capable of radical formation.
19. (New) The membrane of Claim 13, characterized in that the polymerization of step c) takes place by irradiation with IR light, NIR light, UV light, β -radiation, γ -radiation, or electron radiation.
20. (New) The membrane of Claim 13, characterized in that the membrane has an intrinsic conductivity of at least 0.001 S/cm.
21. (New) The membrane of Claim 13, characterized in that the membrane contains between 0.5 and 97% by weight of polymer and between 99.5 and 3% by weight polyvinylphosphonic acid.
22. (New) The membrane of Claim 13, characterized in that the membrane has a layer containing a catalytically active component.

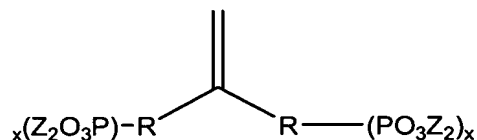
23. (New) A membrane-electrode assembly containing at least an electrode and at least one proton-conducting electrolyte membrane obtained by a method consisting of the steps:
- expanding a polymer film with a liquid that contains a vinyl-containing phosphonic acid, and
 - polymerizing the vinyl-containing phosphonic acid present in the liquid of step a), characterized in that the intrinsic conductivity of the inventive membrane at temperatures of 160°C is at least 0.001 S/cm.
24. (New) The assembly of Claim 23, characterized in that the film used in step a) has an expansion of at least 3% in the liquid containing vinyl-containing phosphonic acid.
25. (New) The assembly of Claim 23, characterized in that the polymers used in step a) are high-temperature stable polymers which contain at least one nitrogen, oxygen, or sulphur atom in one or more recurring units.
26. (New) The assembly of Claim 23, characterized in that the liquid containing the vinyl-containing phosphonic acid contains compounds of the formula



in which

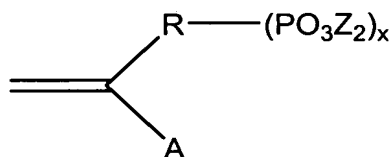
- R denotes a bond, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂
- Z independently of each other denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂ and
- x denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10
- y denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10

or the formula



in which

- R denotes a bond, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂,
- Z independently of each other denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂, and
- x denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10,
- or the formula



in which

- A represents a group of formula COOR², CN, CONR²₂, OR², or R², in which R² denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, or C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂,
- R denotes a bond, a bivalent C1-C15 alkylene group, bivalent C1-C15 alkyleneoxy group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂,
- Z independently of each other denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, or C5-C20-aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂, and
- x denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10.

27. (New) The assembly of Claim 23, characterized in that the liquid containing the vinyl-containing phosphonic acid contains monomers that are capable of cross-linking.
28. (New) The assembly of Claim 23, characterized in that the liquid containing the vinyl-containing phosphonic acid contains at least one substance that is capable of radical formation.
29. (New) The assembly of Claim 23, characterized in that the membrane has an intrinsic conductivity of at least 0.001 S/cm.
30. (New) The assembly of Claim 23, characterized in that the membrane contains between 0.5 and 97% by weight of polymer and between 99.5 and 3% by weight polyvinylphosphonic acid.
31. (New) The assembly of Claim 23, characterized in that the membrane has a layer containing a catalytically active component.
32. (New) A fuel cell containing:
 - one or more proton-conducting electrolyte membranes obtained by a method consisting of the steps:
 - a) expanding a polymer film with a liquid that contains a vinyl-containing phosphonic acid, and
 - b) polymerizing the vinyl-containing phosphonic acid present in the liquid of step a), characterized in that the intrinsic conductivity of the inventive membrane at temperatures of 160°C is at least 0.001 S/cm, or
 - one or more of the proton-conducting electrolyte membranes.